भारतीय मानक
Indian Standard

IS 17217 : 2019

वस्त्रादि — नायलॉन एवं सूती मिश्रित सामग्री से बने जंगल संचालन के लिये विघटित स्वरूप (छलावरण स्वरूप) का कपड़ा — विशिष्टि

Textiles — Disruptive Pattern (Camouflage Pattern) Cloth for Jungle Operations Made of Nylon and Cotton Blended (NYCO) material — Specification

ICS 59.080.30

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August 2019 **Price Group 3**

Man-Made Fibres, Cotton and Their Products Sectional Committee, TXD 31

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards after the draft finalized by Man-Made Fibres, Cotton and Their Products Sectional Committee had been approved by the Textile Division Council.

Camouflage is the technique used to conceal the presence of a person, piece of equipment, or installation by making it blend into its surroundings. Since the 1850’s, militaries around the world have embraced the concept of camouflage in order to help obscure the visibility and movement of their troops by enemy forces.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

TEXTILES — DISRUPTIVE PATTERN (CAMOUFLAGE PATTERN) CLOTH FOR JUNGLE OPERATIONS MADE OF NYLON AND COTTON BLENDED (NYCO) MATERIAL — SPECIFICATION

1 SCOPE

1.1 This standard prescribes the requirement of disruptive pattern (camouflage pattern) cloth for jungle operations made of nylon and cotton blended material, generally known as NYCO.

1.2 This standard does not specify the design/ pattern and stitching of uniform from the disruptive pattern cloth.

1.3 This standard does not specify general appearance, feel, etc, of the disruptive pattern cloth.

2 REFERENCES

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards.

3 MANUFACTURE AND FINISH

3.1 The disruptive pattern cloth shall have rip stop weave (*see* IS 13510). It shall be made from uniform blend of 50 percent nylon 6.6 fibres with 50 percent cotton. The approximate count for guidance for warp and weft yarns may be 20s × 2 (2/40^s) and 16^s respectively. The selvedges shall be firm and straight. The cloth shall be well singed. The fabric shall be 'heat set' and fully shrunk. The blend composition of the cloth shall conform to the requirements given in Table 1.

3.2 The disruptive pattern may be dyed or printed as per the customer's requirements. The dyed and printed pattern shall meet the colour fastness properties as given in Table 1. Dyes used for dyeing and printing shall be free from banned amine (*see* IS 15570). The colour and print design used in the disruptive pattern (camouflage pattern) cloth for jungle operations made of nylon and cotton blended material shall conform to the customer's requirements.

3.3 The fabric should be supplied in the width of 168 ± 2 cm. The length of each piece shall be 40 metres or as agreed between supplier and purchaser.

3.4 Freedom from Defects

The cloth shall be free from major flaws (defects) which shall not exceed 10 per 100 metres length (*see* Note). A list of major flaws (defects) is given in Appendix A of IS 14466 : 1997/ISO 8498 : 1990. The allowance for providing extra length of cloth in lieu of the flaws (defects) not exceeding the permissible limit may be agreed between the buyer and the seller. It

Table 1 Requirements of Disruptive Pattern Cloth

(*Clauses* 3.1, 3.2, 4.1 *and* 7.3.2)

Sl No. (1)	Characteristic (2)	Requirement (3)	Test Method (4)
i)	Composition, percent		
	a) Nylon 6, 6	50 ± 5	IS 2005 : 1988
	b) Cotton	Remainder	
ii)	End/dm, *Min*	400	IS 1963 : 2004
iii)	Picks/dm, *Min*	180	IS 1963 : 2004
iv)	Width, cm	168 ± 2	IS 1954 : 1990
v	Mass, g/m^2	220 ± 10	IS 1964 : 2001

Table 1 (*Concluded*)

Sl No. (1)	**Characteristic** (2)	**Requirement** (3)	**Test Method** (4)
vi)	Breaking strength, N, *Min*		IS 1969 (Part 1) : 2018
	a) Warp-wise	1 200	/ISO 13934-1 : 2013
	b) Weft-wise	650	
vii)	Elongation at break, percent, *Min*		IS 1969 (Part 1) : 2009
	a) Warp-wise	35	
	b) Weft-wise	20	
viii)	Tearing strength, N, *Min*		IS 6489 (Part 1) : 2011
	a) Warp-wise	35	/ISO 13937-1 : 2000
	b) Weft-wise	35	
ix)	Abrasion resistance	a) No thread breakage	IS 12673(Part 2) : 2014
	a) Up to 50,000 cycles	b) Change in colour after Abrasion shall be 3 and above	/ISO 12947-2 : 1998
x)	Colour fastness to washing	4 or better	IS/ISO 105-C10 : 2006
	a) Change in colour	4 or better	
	b) Staining on adjacent fabric		
xi)	Colour fastness to perspiration		IS/ISO 105-E04 : 2008
	a) Change in colour	4 or better	
	b) Staining on adjacent fabric	4 or better	
xii)	Colour fastness to hot pressing (200^{o}C, only dry press)		IS/ISO 105-X11 : 1994
	a) Change in colour	4 or better	
	b) Staining on Adjacent Fabric	4 or better	
xiii)	Colour fastness to rubbing		IS/ISO 105-X12 : 2001
	a) Dry	4 or better	
	b) Wet	4 or better	
xiv)	Colour fastness to sea water		IS/ISO 105-E02 : 1994
	a) Change in colour	4 or better	
	b) Staining on adjacent fabric	4 or better	
xv)	Colour fastness to light	5 or better	IS 2454 : 1985
xvi)	Dimensional change due to relaxation, both directions, percentage, *Max*	1.0	IS 2977 : 1989
xvii)	Dimensional stability to dry heat at 150 ± 2°C, warpway and weftway, Percent, *Max*	2.0	IS 12170 : 1987
xviii)	*p*H Value	6.0 - 8.0	IS 1390 : 1983 (Cold method)
xix)	Pilling (after 5 h of test), *Min*	4	IS 10971 (Part 1) : 2011 /ISO 12945-1 : 2000
xx)	Wrinkle recovery (after 24 h), *Min*	4	IS 16575 : 2016 /ISO 9867 : 2009
xxi)	Air permeability, cc/sec/cm^2, *Min*	3	IS 11056 : 2013
xxii)	Water vapour permeability (water method), g/m^2/day, *Min*	1 400	Annex F of IS 16390 : 2015

shall also be free from dyeing defects, such as streaks, stains and uneven dyeing, and improper printing in case of printed design, etc. The finished cloth shall be free from sizing, filling and dressing materials, and substance liable to cause subsequent tendering. The disruptive pattern cloth shall be free from any other defect which may significantly mark the appearance or serviceability.

NOTE — The number of defects shall be determined on all pieces under test and converted into number of defects per 100 metres length.

4 REQUIREMENTS

4.1 The disruptive pattern uniform cloth shall conform to the requirements given in Table 1.

4.2 If in order to illustrate or specify the indeterminable characteristics, such as general appearance, luster, feel and shade of the suiting, a sample has been agreed upon and sealed, the supply shall be in conformity with the sample in such respect.

4.3 The custody of the sealed sample shall be a matter of prior agreement between the buyer and the seller.

5 MARKING

Each piece of cloth shall be marked with the following :

a) Name of the material disruptive pattern cloth, nylon/cotton blended material;
b) Composition nylon 6.6 : 50 percent, and cotton : 50 percent to be marked on every alternate meter of the cloth at a height not exceeding 2.5 cm from the selvedge;
c) Length and width;
d) Manufacturer’s name, initials or trade-mark; and
e) Any other information required by the law in force and/or by the buyers.

6 PACKAGING AND PACKING

The disruptive pattern uniform cloth shall be packed in polyethylene or polypropylene bags and/or in box, as required by the buyer (*see* IS 2194 and IS 2195).

7 SAMPLING AND CRITERIA FOR CONFORMITY

7.1 Lot

The number of woven suiting pieces of the same type and composition and constructional particulars delivered to a buyer against one dispatch note shall constitute a lot.

7.2 The number of woven suiting pieces to be selected at random shall be according to column 2 and 3 of Table 2. To ensure the randomness of selection, IS 4905 : 2015/ISO 24153 : 2009 may be followed.

7.3 Number of Tests and Criteria for Conformity

7.3.1 The number of pieces to be selected for major flaws shall be in accordance with column 3 of Table 2. For constructional details, such as count of yarn, threads per decimetre, mass in g/m^2, length, width and manufacture and finish, the number of pieces selected shall be in accordance with column 5 of Table 2. For all other tests, the number of pieces selected shall be as given in column 6 of Table 2.

7.3.2 All the pieces selected from the lot shall be visually examined for major flaws and tested for all other requirements as specified in **3.1** to **3.5** and Table 1. A piece shall be declared defective if it contains one or more major flaws or it does not meet any of the requirements specified in Table 1. The lot shall be declared conforming to the requirements of this standard if the total number of defective pieces does not exceed the value given in column 4 of Table 2.

Table 2 Sample Size

(*Clauses* 7.2, 7.3.1 *and* 7.3.2)

Sl No. (1)	Lot Size (2)	Sample Size (3)	Permissible Number of Non-conforming Pieces (4)	Sub-sample Size (5)	Sub-sample Size (6)
i)	Upto 50	5	0	3	2
ii)	51 to 150	8	0	5	3
iii)	151 to 300	13	1	5	3
iv)	301 to 500	20	1	8	5
v)	501 to 1 000	32	3	10	7
vi)	1 001 and above	50	3	10	7

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
1390 : 1983	Method for determination of *p*H value of aqueous extract of textile Materials (*first revision*)
1954 : 1990	Determination of length and width of woven fabrics (*second revision*)
1963 : 2004	Methods for determination of threads per unit length in woven fabric (*second revision*)
1964 : 2001	Textiles — Methods for determination of mass per unit length and mass per area of fabrics (*second revision*)
1969 (Part 1) : 2018/ ISO 13934-1 : 2013	Textiles —Tensile properties of fabrics: Part 1 Determination of maximum force and elongation at maximum force using the Strip method (*fourth revision*)
2005 : 1988	Methods for quantitative chemical analysis of binary mixtures of nylon 6 or nylon 6.6 fibres and certain other fibres (*first revision*)
2194 : 1963	Code for seaworthy packaging of man-made fibre fabrics
2195 : 1964	Code for inland packaging of man-made fibre fabrics and man-made fibre yarns
2454 : 1985	Methods for determination of colour fastness of textile materials to artificial light (xenon lamp) (*first revision*)
2977 : 1989	Fabrics (other than wool) — Method for determination of dimensional changes on soaking in water (*first revision*)
4905 : 2015/ ISO 24153 : 2009	Random sampling and randomization procedures (*first revision*)
6489 (Part 1) : 2011/ ISO 13937-1 : 2000	Textiles — Tear properties of fabrics: Part 1 Determination of tear force using ballistic pendulum method (Elmendorf) (*second revision*)
10971 (Part 1) : 2011/ ISO 12945-1 : 2000	Textiles — Determination of fabric propensity to surface fuzzing and pilling: Part 1 Pilling box method (*first revision*)
11056 : 2013	Textiles — Determination of permeability of the fabrics to air (*first revision*)
12170 : 1987	Method for determination of dimensional stability of textile materials to dry heat treatments
12673 (Part 2) : 2014/ ISO 12947-2 : 1998	Textiles — Determination of the abrasion resistance of fabrics by the Martindale method: Part 2 Determination of the specimen breakdown (*first revision*)
13510 : 2000	Textile — Duck, Polyester/ cotton blended, rip-stop — Specification (*first revision*)
14466 : 1997/ ISO 8498 : 1990	Fabrics — Description of defects — Vocabulary
16390 : 2015	Agro textiles — Nylon knitted seamless gloves for tobacco harvesters — Specification
16575 : 2016/ ISO 9867 : 2009	Textiles — Evaluation of the wrinkle recovery of fabrics — Appearance method
IS/ISO 105-C10 : 2006	Textiles — Tests for colour fastness: Part C10 Colour fastness to washing with soap or soap and soda
IS/ISO 105-E02 : 1994	Textiles — Tests for colour fastness: Part E02 Colour fastness to sea water
IS/ISO 105-E04 : 2008	Textiles — Tests for colour fastness: Part E04 Colour fastness to perspiration
IS/ISO 105-X11 : 1994	Textiles Tests for colour fastness: Part X11 Colour fastness to hot pressing
IS/ISO 105-X12 : 2001	Textiles — Tests for colour fastness: Part X12 Colour fastness to rubbing

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Man-Made Fibres, Cotton and their Products Sectional Committee, TXD 31

Organization	*Representative(s)*
Textiles Committee, Mumbai	Shri S. Ulaganathan (***Chairman***) Shri J. D. Barman (*Alternate*)
Association of Synthetic Fibre Industries, New Delhi	Shri M. S. Verma
Bidhata Industries Pvt Ltd Mumbai	Shri R. K. Pacheriwala Shri Rohit Pacheriwala (*Alternate*)
Central Institute for Research on Cotton Technology, Mumbai	Dr P. K. Mandhyan Dr G. Krisna Prasad (*Alternate*)
Confederation of Indian Textile Industry, New Delhi	Shri D. K. Nair Shri Shaju Mangalam (*Alternate*)
Consumer Guidance Society of India, Mumbai	Dr Sitaram Dixit Dr M. S. Kamath (*Alternate*)
Cotton Association of India, Mumbai	Secretary
Grasim Industries Limited, Vadodara	Shri Ajay Sardana Dr Rohitasva Kumar (*Alternate*)
In Personal Capacity	Shri A. Satheesan
Office of the Textile Commissioner	Shri Ashok Hazra Shri Sourabh Kulkarni (*Alternate*)
Reliance Industries Limited, Mumbai	Shri Prakash Narayan Shri Sanjeev Jaisingh (*Alternate*)
The Bombay Textile Research Association	Shri Lekhraj Galav Shri Ravikant (*Alternate*)
The Cotton Corporation of India Ltd, Navi Mumbai	Shri P. N. Pillewar Shri V. K. Sinha (*Alternate*)
The Cotton Textile Export Promotion Council, Mumbai	Shri Siddartha Rajgopal
The Southern India Mills' Association, Coimbatore	Shri D. Suresh Anand Kumar
The Synthetic & Rayon Textile Export Promotion Council, Mumbai	Shri S K Khandelia Shri Praveen Kumar S Sadh (*Alternate*)
The Synthetic and Art Silk Mills Research Association, Mumbai	Dr Manisha Mathur
BIS Directorate General	Shri A. K. Bera, Scientist 'F' And Head (Textiles) [Representing Director General (*Ex-officio*)]

Member Secretary

Shri A. K. Bera
Scientist 'F' and Head (Textiles), BIS

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